

**Unit 2: Alchemy**  
**Lessons 1-6 Test Review**

Name: KEY  
Date:

Pd:

In order to study for the test, you should:

- ✓ Review all classroom outlines for Lessons 1-6
- ✓ Review all vocabulary terms which are located at the end of each lesson in a list
- ✓ Look over all activity worksheets done for Lessons 1-6
- ✓ Read the lesson summaries found at the end of each lesson
- ✓ Review homework assignments for Lessons 1-6

The test will include both objective and free response portions. If you are absent on the day of the exam, please be ready to take it immediately upon your return.

The following are some sample review questions for each lesson. This worksheet is a selected review for Lessons 1-6 and does NOT cover all material for the test. Also, be aware that you should review the concepts learned in these lessons but will also be required to *apply* this knowledge on the test.

**LESSON 1: Molecular Formulas**

1. a) Name 2 ways to determine if a molecule will smell fishy.

- contains N (amine functional group)
- has "amine" in name

b) Name 2 ways to determine if a molecule will smell sweet.

- Contains 2 oxygen atoms
- has an "ester" functional group
- has name ending in "-ate"

c) Name 2 ways to determine if a molecule will smell putrid.

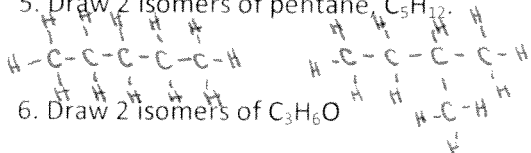
- Contains 2 oxygen atoms
- Contains "carboxylic acid" functional group
- name ends in "-ic acid"

**LESSON 2: Structural formulas**

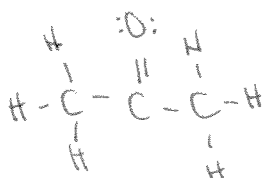
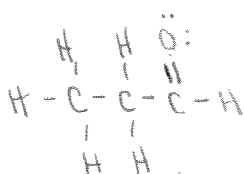
4. What is the difference between a molecular formula and a structural formula? Which type provides more information?

ex Molecular Formula:  $\text{CH}_4$  (shows type and # of atoms)  
Structural:  $\text{H}-\text{C}-\text{H}$  (also shows bonds/arrangement: more info)

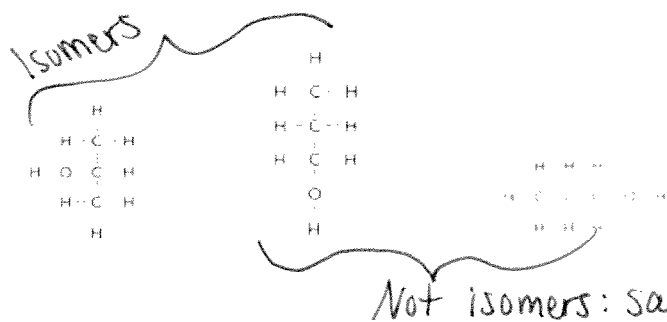
5. Draw 2 isomers of pentane,  $\text{C}_5\text{H}_{12}$ .



6. Draw 2 isomers of  $\text{C}_3\text{H}_6\text{O}$



7. Are the following molecules isomers? Why or why not?



All are  $C_3H_8O$

### LESSON 3: Bonding Tendencies

9. What is the HONC1234 rule?

H forms 1 bond.

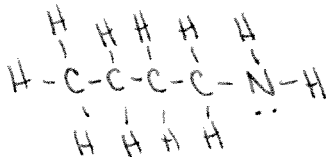
O forms 2 bonds.

N forms 3 bonds.

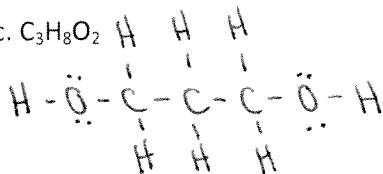
C forms 4 bonds.

10. Draw structural formulas for the following molecules, using the HONC1234 rule. (Include lone pairs if needed) \*Answers may vary.

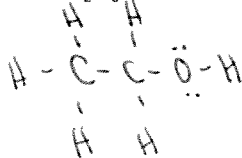
a.  $C_4H_{11}N$



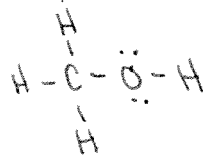
c.  $C_3H_8O_2$



b.  $C_2H_6O$



d.  $CH_4O$



### LESSON 4: Lewis Dot Symbols

11. What does a Lewis dot structure of a molecule show?

Shows all valence  $e^-$ . Each bond = 2  $e^-$ . Shows bonded pairs and lone pairs

12. a) Draw the Lewis dot symbols for the following elements:

a. H



b. N



c. As



d. Br



e. Si



b) How many bonds will each element above form?

a) 1

b) 3

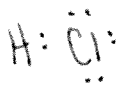
c) 3

d) 1

e) 4

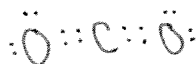
13. Draw Lewis dot structures for the following molecules. Determine how many lone pairs and bonding pairs of electrons are in each.

a. HCl



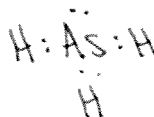
1 bonded  
3 lone

b. CO<sub>2</sub>



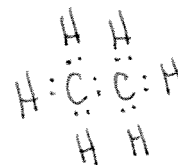
4 bonded  
4 lone

c. AsH<sub>3</sub>



3 bonded  
1 lone

d. C<sub>2</sub>H<sub>6</sub>



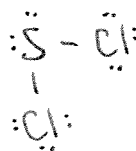
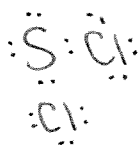
7 bonded  
0 lone

### LESSON 5: Octet Rule

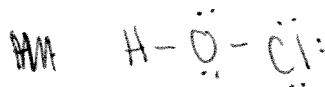
14. What is the octet rule?

Atoms bond so that they have 8 valence e<sup>-</sup> around them.  
(H has 2)

15. Draw a Lewis dot structure for SCl<sub>2</sub>. Draw a structural formula for SCl<sub>2</sub>, including lone pairs.



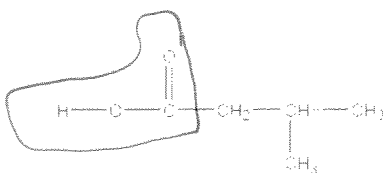
16. Draw the structural formula for HOCl, making sure it follows the octet rule.



17. What is a double bond? A triple bond? → sharing of 3 pairs of e<sup>-</sup> between atoms  
↓  
sharing of 2 pairs of electrons between atoms

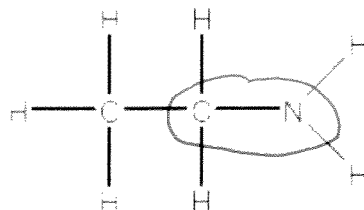
### LESSON 6: Functional Groups

18. In the molecules below, circle the functional group, name the functional group, and determine the smell of the molecule, and write the molecular formula.



a.

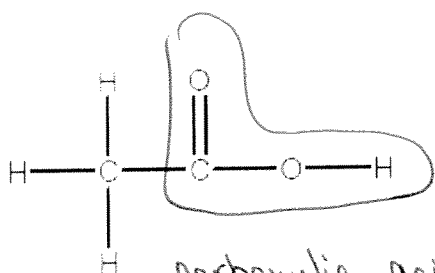
carboxylic acid  
putrid  
 $\text{C}_5\text{H}_{10}\text{O}_2$



b.

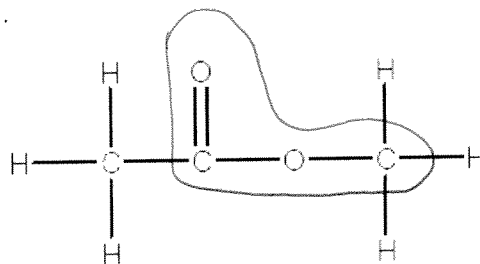
amine  
fishy  
 $\text{C}_2\text{H}_7\text{N}$

c.



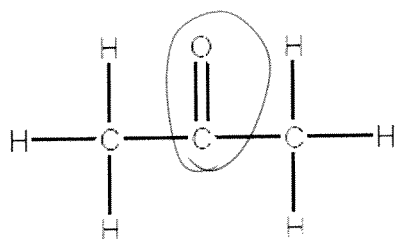
carboxylic acid  
putrid  
 $C_2H_4O_2$

d.



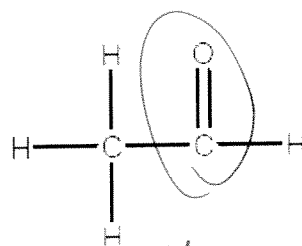
ester  
sweet  
 $C_3H_6O_2$

e.



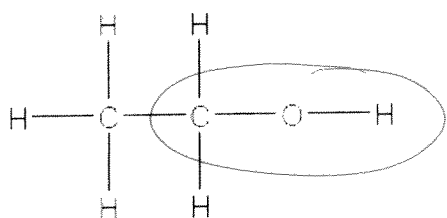
Ketone  
minty  
 $C_3H_6O$

f.



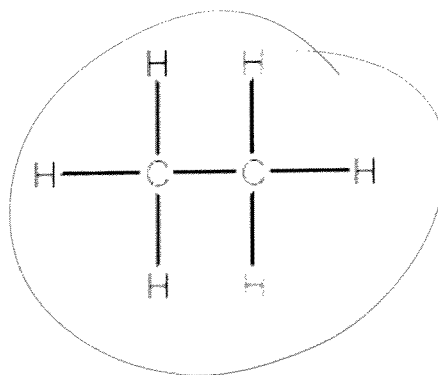
Ketone  
minty  
 $C_2H_4O$

g.



alcohol  
medicinal  
 $C_2H_6O$

h.



alkane  
gasoline  
 $C_2H_6$